

WHAT IS CLAIMED IS:

1. An optical transmitter for converting signals into optical signals and transmitting the optical signals using optical fibers, the optical transmitter comprising:

5 an electric signal generator to convert a received signal into an electric signal;
 a distributed feedback laser diode to convert the electric signal into an optical signal; and

 an optical tunable filter configured to filter the optical signal using a central wavelength, perform a vestigial side band modulation of the optical signal by degenerating
10 a determined band of the optical signal using central wavelength, and reduce the band width of the optical fibers.

2. The optical transmitter according to claim 1, wherein the vestigial side band modulated optical signal is transmitted using the optical fibers.

15

3. The optical transmitter according to claim 1, wherein the optical tunable filter is further configured to enable setting the central wavelength.

4. The optical transmitter according to claim 3, wherein the central wavelength is
20 set such that the power of the optical signals which have passed through the optical tunable filter is reduced at the side band.

5. The optical transmitter according to claim 4, wherein when the optical tunable filter sets the central wavelength to a peak portion of the optical signals, the power of a first logical level of the optical signals which have passed through the optical tunable filter is not reduced, but the power of a second logical level thereof is reduced.

5

6. The optical transmitter according to claim 5, wherein the first logical level is a logical one level of the optical signals.

7. The optical transmitter according to claim 6, wherein the second logical level
10 is a logical zero level of the optical signals.

8. The optical transmitter according to claim 5, wherein the central wavelength set by the optical tunable filter is substantially larger than the central wavelength of the optical signals by 0.1 nm.